

WHAT IS CLAIMED IS:

1     1.     An optoelectronic transceiver, comprising:  
2                 a first controller integrated circuit (IC) and a second controller IC, each  
3     comprising:  
4                 logic;  
5                 a memory configured to store digital diagnostic data, where at least  
6     some of said digital diagnostic data is common to both said first controller IC and said  
7     second controller IC;  
8                 an interface electrically coupled to said memory and configured for  
9     communicating said diagnostic data to a host external to said optoelectronic  
10    transceiver; and  
11                 at least one input port electrically coupled to said memory and  
12    configured to receive said diagnostic data from other components within said  
13    optoelectronic transceiver.

1     2.     The optoelectronic transceiver of claim 1, wherein said interface is a serial  
2    interface.

1     3.     The optoelectronic transceiver of claim 2, wherein said serial interface is  
2    selected from a group consisting of an I2C serial interface, a 2Wire serial interface,  
3    and an MDIO serial interface.

1     4.     The optoelectronic transceiver of claim 1, wherein said other components are  
2    selected from a group consisting of at least one of a Transmitter Optical Subassembly  
3    (TOSA), Receiver Optical Subassembly (ROSA), laser driver IC, a post amplifier IC,  
4    an Avalanche Photodiode (APD) power supply, a Thermoelectric Cooler (TEC) driver  
5    IC, and a power controller IC.

1     5.     The optoelectronic transceiver of claim 1, further comprising additional  
2    components selected from a group consisting of: a Transmitter Optical Subassembly  
3    (TOSA), a Receiver Optical Subassembly (ROSA), a laser driver, a post amplifier, an  
4    Avalanche Photodiode (APD) power supply, a Thermoelectric Cooler (TEC) driver, a

5 power controller, a pre-amplifier, a laser wavelength controller, an analog-to-digital  
6 converter, a digital-to analog converter, or any combination of the aforementioned  
7 components.

8 6. The optoelectronic transceiver of claim 1, wherein said diagnostic data is  
9 stored in different memory mapped locations in said first controller IC and in said  
10 second controller IC.

1 7. The optoelectronic transceiver of claim 1, wherein said at least one output port  
2 of said first controller IC is electrically coupled to: an Avalanche Photodiode (APD)  
3 power supply to supply an APD control signal; and a laser driver IC to supply a direct  
4 current (DC) bias control signal.

1 8. The optoelectronic transceiver of claim 1, wherein said at least one output port  
2 of said second controller IC is electrically coupled to: a laser driver IC to provide an  
3 alternating current (AC) control signal; and a Thermoelectric Cooler (TEC) driver IC  
4 to supply a TEC control signal.

1 9. The optoelectronic transceiver of claim 7, wherein said second controller IC  
2 provides said AC control signal to said laser driver IC via a digital to analog  
3 converter.

1 10. The optoelectronic transceiver of claim 1, wherein said first controller IC  
2 further comprises at least one input port electrically coupled to: an Avalanche  
3 Photodiode (APD) power supply to receive a photodiode monitor signal; a post  
4 amplifier IC to receive a loss of received power (RxLOS) signal; and a laser driver IC  
5 to receive a direct current (DC) bias signal and a laser diode monitor signal.

1 11. The optoelectronic transceiver of claim 1, wherein said second controller IC  
2 further comprises at least one input port electrically coupled to: an Avalanche  
3 Photodiode (APD) power supply to receive a photodiode monitor signal; a laser driver  
4 IC to receive a direct current (DC) bias monitor signal and a laser diode monitor

5 signal; and a Thermoelectric Cooler (TEC) driver IC to receive a TEC temperature  
6 signal.

1 12. The optoelectronic transceiver of claim 10, wherein said second controller IC  
2 receives said photodiode monitor signal and said DC bias monitor signal via an  
3 analog to digital converter.

1 13. The optoelectronic transceiver of claim 1, wherein said second controller IC is  
2 electrically coupled to a thermistor disposed within said optoelectronic transceiver.

1 14. The optoelectronic transceiver of claim 1, wherein said first and second  
2 controller ICs are electrically coupled to a power source.

1 15. The optoelectronic transceiver of claim 1, wherein said first controller IC is  
2 configured to control direct current (DC) bias current supplied to a Transmitter  
3 Optical Subassembly (TOSA).

1 16. The optoelectronic transceiver of claim 1, wherein said first controller IC is  
2 configured to control Avalanche Photodiode (APD) power supplied to a Receiver  
3 Optical Subassembly (ROSA).

1 17. The optoelectronic transceiver of claim 1, wherein said second controller IC is  
2 configured to control alternating current (AC) current supplied to a Transmitter  
3 Optical Subassembly (TOSA).

1 18. The optoelectronic transceiver of claim 1, wherein said second controller IC is  
2 configured to control a Thermoelectric Cooler (TEC) in a Transmitter Optical  
3 Subassembly (TOSA).

1 19. The optoelectronic transceiver of claim 1, wherein the logic of said first  
2 controller IC includes a plurality of state machines and the logic of said second  
3 controller IC includes a processor that executes stored programs.

1       20. An optoelectronic transceiver comprising:  
2           an optoelectronic transmitter;  
3           an optoelectronic receiver;  
4           a laser driver electrically coupled to said optoelectronic transmitter;  
5           a post amplifier electrically coupled to said optoelectronic receiver;  
6           a first controller integrated circuit (IC) electrically coupled to said laser driver,  
7       where said first controller IC is configured to supply a direct current (DC) bias current  
8       control signal to said laser driver causing said laser driver to supply DC bias current  
9       to said optoelectronic transmitter;

10           a second controller IC electrically coupled to said laser driver to supply an  
11       alternating current (AC) current control signal to said laser driver causing said laser  
12       driver to supply AC current to said optoelectronic transmitter.

1       21. The optoelectronic transceiver of claim 20, wherein said optoelectronic  
2       receiver includes an Avalanche Photodiode (APD), where said APD is electrically  
3       coupled to an APD power supply that is electrically coupled to said first controller IC,  
4       and where said first controller IC is configured to supply an APD power supply  
5       control signal to said APD power supply causing said APD power supply to supply an  
6       APD voltage to said APD.

1       22. The optoelectronic transceiver of claim 20, wherein said optoelectronic  
2       transmitter includes a Thermoelectric Cooler (TEC), where said TEC is electrically  
3       coupled to an TEC driver that is electrically coupled to said second controller IC,  
4       where said second controller IC is configured to supply a TEC control signal to said  
5       TEC driver causing said TEC driver to control said TEC.